

ABSTRACT

A magnetic tunneling junction (MTJ) memory cell for a magnetic random access memory (MRAM) array is formed as a chain of magnetostatically coupled segments. The segments can be circular, elliptical, lozenge shaped or shaped in other geometrical forms. Unlike the isolated cells of typical MTJ designs which exhibit curling of the magnetization at the cell ends and uncompensated pole structures, the present multi-segmented design, with the segments being magnetostatically coupled, undergoes magnetization switching at controlled nucleation sites by the fanning mode. As a result, the multi-segmented cells of the present invention are not subject to variations in switching fields due to shape irregularities and structural defects.